

What is claimed is:

1. An oscillator comprising:
an active device;
a substrate;
a microstrip line formed on the substrate; and
a dielectric block disposed to couple with the
microstrip line;
wherein the microstrip line and the dielectric block
form a resonator, the active device and the resonator are
electrically connected with each other, the active device
produces a negative resistance in a desired oscillation
frequency band, and a resonance frequency of the lowest
order mode of the dielectric block is lower than the
desired oscillation frequency and a resonance frequency
band of one of the higher order modes covers the desired
oscillation frequency.
2. An oscillator according to claim 1, wherein the
substrate is a dielectric substrate.
3. An oscillator according to claim 1, wherein the
active device, the microstrip line, and the dielectric
block are mounted on the common substrate.
4. An oscillator according to claim 2, wherein the
active device, the microstrip line, and the dielectric
block are mounted on the common substrate.
5. An oscillator according to claim 1, wherein the

2025 RELEASE UNDER E.O. 14176

active device is mounted on another substrate different from the substrate.

6. An oscillator according to claim 2, wherein the active device is mounted on another substrate different from the substrate.

7. An oscillator according to claim 1, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

8. An oscillator according to Claim 2, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

9. An oscillator according to claim 3, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

10. An oscillator according to claim 4, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

11. An oscillator according to claim 5, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

12. An oscillator according to claim 6, wherein the oscillator includes a variable reactance device between the active device and the resonator, and a control of an oscillation frequency is possible by a characteristic control of the variable reactance device.

13. A transmitter-receiver module comprising:
a local signal generator; and
an antenna unit connected electrically to the local signal generator;
wherein the local signal generator includes an oscillator, and the oscillator comprises:
an active device;
a substrate;
a microstrip line formed on the substrate; and
a dielectric block disposed to couple with the microstrip line;

wherein the microstrip line and the dielectric block form a resonator, the active device and the resonator are electrically connected with each other, the active device produces a negative resistance in a desired

oscillation frequency band, and a resonance frequency of the lowest order mode of the dielectric block is lower than the desired oscillation frequency and a resonance frequency band of one of the higher order modes covers the desired oscillation frequency.

14. A transmitter-receiver module according to claim 13, wherein the substrate is a dielectric substrate.

15. A transmitter-receiver module according to claim 13, wherein the active device, microstrip line, and dielectric block are mounted on the common substrate.

16. A transmitter-receiver module according to claim 13, wherein the active device is mounted on another substrate different from the substrate.

17. A radar system comprising:
a local signal generator;
a transmitter antenna connected electrically to the local signal generator;
a mixer connected electrically to the local signal generator; and
a receiver antenna connected electrically to the mixer;

wherein the local signal generator includes an oscillator, and the oscillator comprises:

an active device;
a substrate;

P-0002-2002-000000000000

a microstrip line formed on the substrate; and
a dielectric block disposed to couple with the
microstrip line;

wherein the microstrip line and the dielectric
block form a resonator, the active device and the resonator
are electrically connected with each other, the active
device produces a negative resistance in a desired
oscillation frequency band, and a resonance frequency of
the lowest order mode of the dielectric block is lower than
the desired oscillation frequency and a resonance frequency
band of one of the higher order modes covers the desired
oscillation frequency, and

wherein the transmitter antenna radiates a signal
generated by the local signal generator as a transmission
signal, the receiver antenna receives a reflection signal
that the transmission signal is reflected on a target, and
the mixer mixes the reflection signal and the signal
generated by the local signal generator.

18. A radar system according to claim 17, wherein
the substrate is a dielectric substrate.

19. A radar system according to claim 17, wherein
the active device, microstrip line, and dielectric block
are mounted on the common substrate.

20. A radar system according to claim 17, wherein
the active device is mounted on another substrate different

from the substrate.